

What is claimed is:

1. A deicing and/or anti icing composition comprising one or more glycerol-
5 containing by-products of triglyceride reactions selected from the group consisting
of (1) glycerol containing by-products of triglyceride saponification reactions, (2)
glycerol containing by products of triglyceride hydrolysis reactions glycerol, (3)
glycerol containing by-products of tranesterification reactions and (4) mixtures
thereof.
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2. A deicing and/or anti-icing composition as defined in Claim 1 wherein said
glycerol-containing by-product further comprises unreacted fatty acid,
unseparated reactants, unseparated product and mixtures thereof.
- 15 3. A deicing and/or anti-icing composition as defined in Claim 1 wherein said
saponification by-product is selected from the group consisting of spent lye,
skimmed spent lye, purified spent lye, neutralized crude glycerol, pH adjusted
crude glycerol, desalted crude glycerol, glycerol remnant, partially refined
glycerol and mixtures thereof.
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4. A deicing or anti-icing composition as defined in Claim 1 wherein said by-product
of a triglyceride hydrolysis reaction comprises a reactor bottoms stream from a
hydrolysis reactor.
- 25 5. A deicing and/or anti-icing composition as defined in Claim 4 wherein said
reactor bottoms further is processed through an evaporation step to remove at least
part of the water contained therein.

6. A deicing and/or anti-icing composition as defined in Claim 1 wherein said triglyceride processing by-product comprises a glycerol containing by-product of a catalyzed transesterification reaction employing a monoalcohol to produce monoesters from fats and oils.
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7. A deicing and/or anti-icing composition as defined in Claim 6 wherein said monoesters are produced for use in diesel fuel.
8. A deicing and/or anti-icing composition as defined in Claim 6 wherein said
10 monoalcohols are selected from the group consisting of methanol, ethanol and mixtures thereof.
9. A deicing and/or anti-icing composition as defined in Claim 6 wherein said
15 glycerol containing by-product comprises the transesterification reactor effluent from which unconverted monoalcohol has been at least partially stripped for recovery and/or recycling.
10. A deicing and/or anti-icing composition as defined in Claim 9 wherein said
20 reactor effluent further is processed to remove at least part of the contained water.
11. A deicing and/or anti-icing composition as defined in Claim 6 wherein a base is used as a catalyst in said transesterification reaction.
12. A deicing and/or anti-icing composition as defined in Claim 11 wherein said base
25 is selected from the group consisting of sodium hydroxide, potassium hydroxide and mixtures thereof.

13. A deicing and/or anti-icing composition as defined in Claim 11 wherein said base catalyst is neutralized with an acid neutralizer.
14. A deicing and/or anti-icing composition as defined in Claim 13 wherein said acid neutralizer is selected from the group consisting of inorganic acids carbonic acids, hydroxycarboxylic acids, carboxylic acids, dicarboxylic acids and mixtures thereof.
15. A deicing and/or anti-icing composition as defined in Claim 14 wherein said acid neutralizer comprises acetic acid, lactic acid or mixtures thereof.
16. A deicing and/or anti-icing composition as defined in Claim 9 wherein said triglyceride processing by-product is processed further to remove substantially all of said base catalyst, unreacted fatty acid and unseparated product.
17. A deicing and/or anti icing composition as defined in Claim 1 wherein said glycerol-containing triglyceride processing by-product is present in an amount ranging from about 2 to about 100 weight percent of the total composition.
18. A deicing and/or anti-icing composition as defined in Claim 1 wherein said composition further comprises an effective freezing point lowering amount of an additive comprising (a) a hydroxyl-containing organic compound selected from the group consisting of hydrocarbyl aldoses; sorbitol and other hydrogenation products of sugars, monosaccharides, maltodextrins and sucrose; maltitol; glycols; monosaccharides and mixtures thereof, and/or (b) an acid salt selected from the group consisting of a carbonic acid salt, a carboxylic acid salt, a hydroxycarboxylic acid salt, a dicarboxylic acid salt and mixtures thereof.

19. A deicing and/or anti-icing composition as defined in Claim 18 wherein said additive is present in an amount ranging from about 0.5 to about 95 weight percent based on the weight of the hydroxyl-containing triglyceride processing by-product and additive combined.
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20. A deicing and/or anti-icing composition as defined in Claim 18 wherein said hydrocarbyl aldose comprises an alkyl aldose.
21. A deicing and/or anti-icing composition as defined in Claim 20 wherein said alkyl aldose is selected from the group consisting of alkyl glucosides, an alkyl furanosides, alkyl maltosides, alkyl maltotriosides, alkylglucopyranosides and mixtures thereof.
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22. A deicing and/or anti-icing composition as defined in Claim 18 wherein said hydrocarbyl aldose comprises a disaccharide, a polysaccharide or mixtures thereof.
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23. A deicing and/or anti-icing composition as defined in Claim 18 wherein said hydrogenation product of sugars comprises sorbitol, maltitol, xylitol, mannitol or mixtures thereof.
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24. A deicing and/or anti-icing composition as defined in Claim 18 wherein said glycols comprise ethylene glycol, propylene glycol, diethylene glycol, dipropylene glycol or mixtures thereof.
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25. A deicing and/or anti-icing composition as defined in Claim 18 wherein said monosaccharide is selected from the group consisting of glucose, fructose and mixtures thereof.

26. A deicing and/or anti-icing composition as defined in Claim 18 wherein said carboxylic acid salts are selected from the group consisting of potassium or sodium salts of formates, acetates, propionates, butyrates and mixtures thereof.
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27. A deicing and/or anti-icing composition as defined in Claim 18 wherein said hydroxycarboxylic acid salt is selected from the group consisting of the sodium and potassium salts of lactic acid, gluconic acid and mixtures thereof.
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28. A deicing and/or anti-icing composition as defined in Claim 18 wherein said dicarboxylic acid is selected from the group consisting of the potassium or sodium salts of oxalates, malonates, succinates, glutarates, adipates, maleates, fumarates and mixtures of any of the foregoing.
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29. A deicing and/or anti-icing composition as defined in Claim 1 wherein said carbonic acid is selected from the group consisting of the potassium carbonate, potassium bicarbonate, sodium carbonate, sodium bicarbonate and mixtures of any of the foregoing.
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30. A deicing and/or anti-icing composition as defined in Claim 1 wherein said hydroxyl-containing triglyceride processing by-product is combined with an effective freezing point reducing amount of a hydroxyl-containing organic industrial process stream.
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31. A deicing and/or anti-icing composition as defined in Claim 30 wherein said industrial process stream is selected from the group of grain stillage, wood stillage, grain steepwaters, products of agricultural or milk fermentation processes, cane or beet sugar extraction processes and mixtures thereof.

32. A deicing and/or anti-icing composition as defined in Claim 1 wherein said hydroxyl-containing triglyceride processing by-product stream is combined with an effective freezing point reducing amount of an organic component selected from the group consisting of citrate salts, amino acids, amino acid salts, lignin components, boric acid, boric acid salts sodium citrate, lysine glutamate, sodium pyrrolidone carboxylate, sodium glucoheptonate, lignin sulfonate and mixtures thereof.
33. A deicing and/or anti-icing composition as defined in Claim 1 wherein said hydroxyl-containing triglyceride processing by-product stream is combined with an effective freezing point reducing amount of an inorganic salt.
34. A deicing and/or anti-icing composition as defined in Claim 27 wherein said inorganic salt is selected from the group consisting of sodium chloride, calcium chloride, magnesium chloride, potassium phosphates, sodium phosphates, ammonium phosphates, ammonium nitrates, alkaline earth nitrates, magnesium nitrate, ammonium sulfate, alkali sulfates and mixtures thereof.
35. A method of deicing and/or anti-icing a surface, said method comprising adding to said surface a composition as defined in Claim 1.
36. A method as in Claim 35 wherein said surface is a pedestrian walkway or a vehicular roadway, highway, bridge or parking facility.
37. A method as in Claim 35 wherein said surface is an aircraft surface comprising wings, fuselage or tail surfaces.

38. A method as in claim 35 wherein said surface is an airport runway or taxiway.
39. A method as in Claim 35 wherein said surface comprises the deck or portion of a
superstructure of a ship.
- 5 40. A method as in Claim 35 wherein said surface comprises weather exposed
industrial equipment.
- 10 41. A method as in Claim 40 wherein said industrial equipment is selected from the
group consisting of conveyor systems; storage facilities; support systems and lines
for transmission of electric power or electronic signals; or exposed machinery or
processing equipment.
- 15 42. A method as in Claim 35 wherein said surface comprises the surfaces of particles
selected from the group consisting of coal, ores, sand and gravel.
- 20 43. A liquid material for use at temperatures below the freezing point of water, said
liquid comprising the anti-icing composition as defined in Claim 1.
44. A method as defined in Claim 43 wherein said liquid material is used as a fire
extinguisher fluid.
- 25 45. A liquid material as defined in Claim 43 wherein said liquid material is used as a
heat transfer agent.
46. A liquid material as defined in Claim 45 wherein said heat transfer agent is
employed in an application selected from the group consisting of vehicular

radiator systems, air conditioning systems, systems for transferring process heat and systems for recovery of heat from process or power generation systems.

47. A liquid material as defined in Claim 43 wherein said liquid material is used as a component of fluids used in drilling oil and gas wells.
48. A method for deicing and/or anti-icing comprising of applying the deicing or anti-icing composition defined in Claim 1 in a solid format to an area in need of deicing or anti-icing.
49. A method as in Claim 48 wherein said solid format is achieved by absorbing or adsorbing said deicing or anti-icing composition on an inert solid or binder.
50. A method as in Claim 49 wherein said inert solid or binder is selected from the group consisting of cinders, sand, sawdust, gravel and mixtures thereof.
51. A method as in Claim 48 wherein said solid format is achieved by absorbing or adsorbing said deicing or anti-icing composition on a solid deicing material.
52. A method as in Claim 51 wherein said solid deicing material is selected from the group consisting of sugars, maltodextrins, inorganic salts, organic salts or mixtures thereof.
53. A method as in Claim 52 wherein said inorganic salts are selected from the group consisting of sodium chloride, magnesium chloride, calcium chloride, trona and mixtures thereof.

54. A method as in Claim 52 wherein said organic salts are selected from the group consisting of sodium or potassium salts of formic acid, acetic acid, lactic acid, calcium magnesium acetate, or mixtures thereof.
- 5 55. A method as in Claim 48 wherein the solid format is achieved by processing said composition employing a procedure for converting a liquid to a solid.
56. A method as in Claim 55 wherein said procedure is selected from the group consisting of pelletizing, prilling, flaking, macerating and combinations thereof.
- 10 57. A deicing or anti-icing composition as in Claim 1 further comprising a corrosion inhibitor.
58. A deicing or anti-icing composition as in Claim 57 wherein said corrosion
15 inhibitor is selected from the group consisting of inhibitors comprising salts of gluconic acid, inhibitors comprising monocarboxylic acid salts and mixtures thereof.
59. A deicing or anti-icing composition as in Claim 1 further comprising solid
20 materials to provide traction for vehicular traffic.
60. A deicing /and/or anti-icing composition as in Claim 59 wherein said solid materials are selected from the group consisting of sand, gravel, abrasives, salt and mixtures thereof.
- 25 61. A method for preventing frost damage to vegetation, said method comprising applying the deicing and/or anti-icing composition as in Claim 1 to said vegetation.

62. A method as in Claim 61 wherein said vegetation comprises pre-harvest fruits and vegetables, buds of fruit trees, recreational surfaces or golf greens.

5 63. A process for preparing the glycerol-containing by product as defined in Claim 9 wherein the major portion of unconverted monoalcohol is removed from said reactor effluent prior to removing a major amount of the water contained therein.

10 64. A process as described in Claim 63 wherein the process is a fractional distillation process conducted at low pressure, or under a vacuum.